

FOUNDATIONS OF SCIENCE

WEEK 1—THE SCIENTIFIC METHOD

Day 1

Learn:

Before starting this week of science, each student should look up each word in a dictionary or online. Write out a short definition for each. Place these vocabulary words and definitions into a notebook.

- Observation
- Hypothesis
- Experiment
- Prediction
- Theory
- Assumption
- Causality

Hear:

Discuss the following together:

Note: How will you discover the answers to these questions? One way is to sit by a computer and look things up together as you discuss. Before doing so, look up and discuss Proverbs 18:17.

- All scientific investigation starts with curiosity. What do you think this means? Have you ever been curious about something YHWH made?
- The process of investigation is called the “scientific method.” What does each word mean?
 1. Observing (gathering facts)
 2. Hypothesizing (suggesting explanations)
 3. Experimenting (testing explanations)
- What would happen if a scientist could not observe something? How can he prove that what he is observing is true? Look up Deuteronomy 19:15.
- What is an experiment?
- What is a prediction? The ability to be accurately tested is a sign of a good prediction. What does this mean?
- What is “cause and effect”?
- What is a theory? What is a theory that has successfully been tested repeatedly?
- As a family, make a chart illustrating the scientific method, which you can hang on your wall.

Day 2

Hear:

- Watch the 5-minute [video about Newton's First Law of Motion](#).
- Why did these three scientists become curious?
- How did they use the Observation step of the scientific method?
- How did they use the Hypothesis step?
- How did they use the Experimentation step?
- How can you see cause and effect in this illustration? Are there any causes or effects that you might not be thinking of?
- Why do you think this is called a *Law* of motion, and not just a theory?

Day 3

Hear:

Discuss the following together:

- Look it up:
 - What does it mean to be accurate?
 - What does it mean to be precise?
 - Add these two words to your vocabulary for the week.
- We call mathematics the “language of science.” Why do you think this is?
- What is an equation?
- What is trial and error?
- What is a measurement? Can you name some things that can be measured? (*Length, volume, mass, time, temperature. Define as needed.*)
- What are significant figures?
- What is scientific notation?
- What is the metric system?

Day 4

Do:

- You've probably noticed that your tongue can taste many different flavors. (Can you name some?) Do you think you know why?
- Suggest a hypothesis as to why your tongue can taste different flavors. Write your hypothesis down in a complete sentence.
- Before doing the following experiment, predict what you think will happen. Write your prediction down in a complete sentence.
- Experiment: <http://www.scholastic.com/parents/resources/article/science-nature-activities/home-science-experiments-tongue-map>
- Analyze your results. Was your hypothesis correct? Did your prediction come true? Were the results repeatable? Why or why not?
- Look at the topic again by visiting this website: <http://pbskids.org/zoom/activities/sci/tonguemap.html>
- Could you design a better experiment? What would make it better?
- You may wish to download a [Science Experiment Record Form](#) from our website.

Day 5

Do:

- Notebooking – Make a page for your notebook. Be sure to include a paragraph that tells what you learned this week.
- Research – Have you become more curious about anything in YHWH’s creation this week? Start a page in your notebook where you can list things you’re curious about. Be sure to write things down quickly before you forget them! Choose one topic to look up online or in a book today. Tell your parents what you learned about that topic.
- High School – Check out a library book on the life of Sir Isaac Newton or Galileo Galilei. Try to have it read within a week. Make a list of 3-5 character qualities in their lives that helped them become excellent scientists. Plan to share the list with your family next week.